

traffic lanes and for the frequencies of different weights and dimensions of large vehicles on highways for the general design policies for both roads and bridges, and for legal restrictions as to weights and dimensions of vehicles. It will be used also to establish a measure of the commercial-traffic characteristics, to be used to determine the degree of adequacy of existing improvements.

Some of the other states that have been able to complete their original survey have outlined and planned their highway program for the next twenty years. Indiana hopes to be able to do something similar in the near future.

PRESENT AND FUTURE STATUS OF THE FARM-TO-MARKET ROAD PROGRAM

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At the 1938 Purdue Road School I talked on the subject "The Farm-to-Market Federal Road Program." Today I shall attempt to explain the "Present and Future Status of the Farm-to-Market Road Program" as it applies to the State of Indiana.

HAYDEN-CARTWRIGHT ACT

On the former occasion I set out at considerable length the preliminary proceedings and details involved, in order that a true picture might be had of the mechanics required in establishing a Federal Aid Secondary Road project. That discussion referred to the action of Congress resulting in what is commonly known as the "Hayden-Cartwright Act" approved June 16, 1936, which act authorized to be appropriated to the several states to be apportioned and expended under the provisions of the Federal Highway Act of 1921, as amended and supplemented: "The sum of \$25,000,000.00 for fiscal year ending June 30, 1938, and like amount for fiscal year ending June 30, 1939: Provided, That the sums authorized be applied to Secondary or Feeder Roads, including farm-to-market roads, rural free delivery mail roads, and public school bus routes."

MEANS OF ADMINISTERING ACT

The Federal Highway Act required the Secretary of Agriculture to prescribe and promulgate all needful rules and regulations for the carrying out of its provisions. In compliance with this responsibility, the Secretary of Agriculture caused to be prepared and approved on February 9, 1937, certain basic rules and regulations for carrying out the provisions of the secondary- or feeder-road legislation.

DEFINITION OF SECONDARY OR FEEDER ROADS

Under these regulations the following definition of such roads was given:

"Secondary or Feeder Roads" shall mean roads outside of municipalities, except as hereafter provided, which are not included in the Federal-aid highway system, and shall include farm-to-market roads, mine-to-market roads, rural free delivery mail roads, public school bus routes and other rural roads of community value which connect with important highways, or which lead to rail or water shipping points or local settlements. The limitation with respect to roads within municipalities shall not be construed to prevent improvements into or through small municipalities when such improvements are necessary for continuity of service.

PROVISIONS OF RULES AND REGULATIONS

These regulations stipulated further that all projects under the secondary- or feeder-road act be initiated by the states and submitted in the same manner as other Federal-aid projects and that the funds apportioned to any state under the act be applied to projects, essentially rural in character, that are not on highway routes that are potential additions to the Federal-aid highway system within a reasonable interval. It was further directed that the Chief of the Bureau of Public Roads determine to what extent secondary- or feeder-road projects may be located on the state highway system. To accomplish a wide distribution of benefits within each state in the expenditure of funds authorized by the act without a sacrifice of administrative or construction efficiency, the Chief of the Bureau of Public Roads was further directed to determine the minimum percentage of counties, applicable alike in each state, in which the funds authorized for any one or more fiscal years should be used. No projects were to be undertaken that did not provide for a surfacing or stabilization of the roadbed that should be reasonably satisfactory for the traffic served. Grading and drainage as first stage construction might be accepted: provided that the state highway department would enter into a satisfactory agreement for future surfacing or stabilization of the roadbed.

Each state highway department was directed to undertake the selection and designation of an initial system or group of secondary or feeder roads for construction or reconstruction in accordance with their relative importance as determined from factual data secured from statewide studies for the planning of a complete highway system, and to submit a suitable description and map of such proposed system or group to the Bureau of Public Roads for approval: provided that prior to the selection, designation, and approval of such system or group of secondary or feeder roads, projects might be approved for construction if it were reasonably anticipated

that such projects would become a part of such system or group.

The mileage of the initial system or group of secondary or feeder roads in any state was not to exceed 10 per cent of the highway mileage of the state as shown by the records of the state highway department at the time of the passage of the Federal Highway Act. The initial system or group of secondary or feeder roads could be selected, designated, and approved in whole or in part in any state and might be modified, or increased, from time to time as justified by the progress of its improvement.

Surveys and plans, specifications, and estimates for all projects in each state were to correspond to the character of the work contemplated, should be in sufficient detail to show the quantity and kind of work involved, and should be prepared under the immediate direction of the state highway department without reimbursement from federal funds. The state highway department, however, might utilize the services of well-qualified county engineering organizations, acting under its direction, for the surveys, preparation of plans, specifications, and estimates, and for the supervision of construction for any project.

Project agreements for secondary- or feeder-road projects should provide for the maintenance of such projects by the state to the extent permitted by state law; otherwise, the state should submit, in the form prescribed by the Secretary of Agriculture, an agreement for such maintenance with the county or other political subdivision responsible therefor: provided, however, that no project contemplating maintenance by a county or other political subdivision would be approved if any road previously improved with federal funds under the provisions of the Federal Highway Act, as amended and supplemented, which the county or other political subdivision has agreed to maintain, is not being satisfactorily maintained as determined by the Chief of the Bureau of Public Roads.

SUPPLEMENT TO RULES AND REGULATIONS BY CHIEF OF THE U. S. BUREAU OF PUBLIC ROADS

Supplementing the rules and regulations as prescribed by the Secretary of Agriculture, the Chief of the Bureau of Public Roads issued a memorandum on February 12, 1937, requiring that secondary- or feeder-road projects be undertaken in not less than 50 per cent of the counties of a state in the expenditure of the combined funds authorized for the two-year fiscal period, 1938 and 1939. In the State of Indiana, with 92 counties, this meant that projects must be undertaken that would enter at least 46 counties. In this same memorandum, provision was made for determining the percentage of federal grant that might be used on highways now in

the state system. In Indiana, this amounts to 23½ per cent, leaving 76½ per cent of the fund to be used on roads maintained by the counties. The Bureau of Public Roads further prescribed that secondary-highway funds must be matched with "state funds" raised under the authority of the state or any political or other subdivision thereof, and made available for expenditure under the direct control of the state highway department. This requirement permitted considerable latitude in financing projects. In general, the Bureau expects funds from state sources to be used for secondary or feeder roads in states where all of the revenue derived from motor-vehicle registration and gasoline taxes accrues to the state highway department. In such states no involuntary contributions from any political subdivision will be approved. In states where a portion of the motor-vehicle registration or gasoline taxes is distributed to the counties and the amount so distributed to any county exceeds the requirement for debt service on highway obligations of the county, if any, the state at its discretion may arrange for such county to aid financially in the construction of any secondary- or feeder-road project undertaken in that county.

The Bureau stipulated that design requirements for alignment and grade for secondary or feeder roads be consistent with the topography and the purpose to be served by the improvement.

APPORTIONMENT TO INDIANA AND MANNER OF DISTRIBUTION

In compliance with the usual method of apportioning congressional appropriations for highway purposes (based, one-third each, on area, population, and rural road mileage of the respective states), Indiana was allocated for the fiscal year 1938 the sum of \$629,802.00. Of this amount 23½ per cent, or \$148,003, was available for projects to be set up on existing state highways, and 76½ per cent, or \$481,799, for improvement of highways maintained by the counties.

PRELIMINARY PROCEDURE AND 1938 PROGRAM

The several counties of the state were reached through correspondence, group meetings, and personal visits by the state's field organizations, after which the 1938 funds were programmed as of January 6, 1938, and later, because of failure or inability of certain counties to provide necessary right-of-way, revised as of April 12, 1939. The sum set out for use on existing state highways was broken into four projects, entering seven counties and covering the improvement of 48 miles of road. These four projects have been completed and paid for, leaving a balance in the state's portion of the 1938 fund of only \$3.00. The sum set out for use on highways maintained by the counties was divided among 16 projects, entering 20 counties, and covering the

improvement of 87 miles of road. Contracts have been awarded on 15 of these projects, of which 14 have been completed and one is well under way. The one not contracted is ready for letting at such time as right-of-way is made available by the county concerned. These 16 projects will absorb all the 1938 funds stipulated to be used on county-maintained roads.

1939 PROGRAM

The funds allocated to Indiana for 1939—\$612,636—were partially programmed on January 6, 1938, and revised in complete form on April 12, 1939. These were divided as between state-road and county-highway projects, in the same way as for the year 1938. Again, four projects were planned for roads in the state system, amounting to \$143,969, entering five counties and improving about 20 miles of roads. The mileage looks small in this instance, but one of the projects involved construction of a bridge of considerable magnitude. Three of these projects have been completed, and the fourth is well under way.

The portion of 1939 funds designated for use on county-maintained roads was apportioned to 16 projects entering 16 counties, contemplating the improvement of 94 miles of highway, and utilizing the entire appropriation of \$468,667. Contracts have been awarded on only six of these projects, although two more were advertised for letting on February 6. Of the six projects on which contracts were awarded, four have been completed, one is substantially completed, and one is well under way. Half the remaining projects, not contracted, seem to be stalemated at this time, because of failure or inability of the counties concerned to acquire the needed right-of-way.

TYPES OF CONSTRUCTION

Rules and regulations, as previously stated, contemplate that improvements of secondary or feeder roads shall be of such nature as to prove reasonably satisfactory for the traffic served. Mindful of these regulations and other limitations in the way of funds and wide distribution necessary, comparable competitive types of construction were set up and contracts were awarded on the 1938 program as follows:

The four projects built on state roads consisted of two traffic-bound crushed stone, one traffic-bound gravel, and one bituminous-coated aggregate surface, the latter being placed on a surface-treated, chemically-stabilized base. The 15 projects built, or in process of construction, on county-maintained roads comprise six types of surfaces, as follows: two traffic-bound gravel, two traffic-bound crushed stone, one surface-treated waterbound macadam, three bituminous-stabilized gravel, six bituminous-stabilized crushed stone, and one bituminous retread on waterbound macadam base.



Fig. 1. View of completed F. A. S. project 41-A1 extending from St. Wendells to State Road 65 in Vanderburgh County. Surface stabilized with emulsified asphalt.

The four projects built on state roads under the 1939 program consisted of the following surfaces: two traffic-bound gravel, one traffic-bound crushed stone, and one bituminous retread on waterbound macadam base. Of the six projects contracted on county-maintained roads under the 1939 program, one provides for a traffic-bound crushed-stone surface and the other five are for stabilized crushed-gravel surfaces.



Fig. 2. Traffic-bound gravel surface on F. A. S. 42-A1 extending westward from Millersburg in Warrick County. Note bituminous-stabilized overflow to prevent erosion on downstream slope.

The following is taken from my talk before 1938 Purdue Road School:

An effort is being made to secure right-of-way, grade, and alignment on all projects that will permit future expansion without economic loss. At this time only a modest surface that is in keeping with traffic requirements is contemplated. It is my belief that the highway authorities consistently adhering to the policy of stage construction will be able to improve the maximum number of miles and give appropriate service to the maximum number of people at the minimum cost; in other words, highways should be built where needed in the measure needed.

SOME PERTINENT FACTS

We all recognize that certain legal restrictions and limitations must be adhered to in the handling of public funds. This is true with state and counties alike. The counties have to satisfy their own county councils, the State Tax Board, and the State Board of Accounts; and the State Highway Department has to satisfy the Budget Committee, the State Board of Accounts, and the Public Roads Administration of the Federal Works Agency. State funds cannot be used in purchase of right-of-way on county-maintained roads, and federal regulations will not permit the undertaking of improvement until suitable right-of-way is made available.

The State Highway Department has, at considerable cost paid entirely from State Highway funds, made surveys, prepared plans, secured approval of the Federal Bureau, and in three instances advertised and tentatively awarded contracts only to be advised at a later date by the county authorities involved that they had abandoned the idea of securing right-of-way. There are now a number of projects ready to be advertised as soon as right-of-way is made available.

1940 AND 1941 FEDERAL APPROPRIATIONS

The sums allocated to the State of Indiana from Federal appropriations for years of 1940 and 1941 are \$363,887.00 and \$363,749.00, respectively, none of which has been programmed at this time.

PREPARATION OF PROPOSED SECONDARY OR FEEDER ROAD SYSTEM

The State Highway Commission of Indiana, through its Statewide Highway Planning Survey, has been gathering and assembling factual data for the planning of a complete highway system, this being a requirement under rules of the Federal Department, as previously stated, before the proposed secondary- or feeder-road system may be submitted for approval of the Public Roads Administration of the Federal Works Agency. Work of the Statewide Highway Planning Survey, in so far as it is needed in connection with proper

presentation of a proposed secondary system, is practically completed; in fact, these studies have been completed in certain areas, even to the extent that a partial system involving one block of ten counties has already been done and submitted along with supporting factual data requesting approval of Federal authorities. Other counties are being completed daily, and it will be only a matter of a few weeks until the entire proposed Indiana secondary- or feeder-road system will be ready for Federal consideration. The contemplated system that is being presented at this time designates only about one-third of our allowable ten per cent, amounting to 2,525 miles out of a possible 7,575 miles. This mileage far exceeds that which can be improved in the next several years unless appropriations are materially increased; therefore, we see no advantage in requesting approval of a greater system at this time. In fact, new and different conditions, suggesting an entirely different layout, may arise in the interval of time between the date of approval of the system and the date when improvements may be programmed. With two thirds of the allowable mileage uncommitted, it will be possible from time to time, as occasion warrants, to designate additional roads meeting secondary- or feeder-road requirements.

CONCLUSIONS

I dare say some of you will ask, and properly so, "Why hasn't this or that road in our county been programmed?" By way of explanation, I will first call your attention to fact that the State Highway Field Organization is broken into six districts, each comprising about one-sixth of the area of the State. As mentioned in the early part of this discussion, the preliminary work in connection with establishing a secondary- or feeder-road program and system included group meetings with the counties, followed by correspondence and personal contact. In order to get wide and proper distribution of funds throughout the State and not have them largely spent in one general area, for instance the north end or the south end of the State, each of the six State Highway District Offices was asked to submit a number of projects that met Federal requirements, whose total cost would amount to approximately one sixth of the available fund, and so located as to enter one sixth of the total number of counties required to be served by 1938-1939 programs. Roughly, each district had to plan something for eight out of sixteen counties in which it operates. I am at a loss to know what further effort could have been made to work up a program meeting all legal requirements and serving the best interests of the State at large.

I ask the question, "Have any of you county officials ever worked out a program that fully satisfied all townships and road districts of your own county for any one year?" The future of this program is up to you. I might predict that,

if right-of-way cannot be had on suitable county-road projects, it is only a question of time until arrangements will be made for spending the entire sum on State-maintained roads.

PRESENT AND FUTURE STATUS OF THE FARM-TO-MARKET ROAD PROGRAM

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I am sure those of you who have sponsored a farm-to-market road will agree with me that there is no Santa Claus when it comes to giving you roads with no effort.

To those of you who have not sponsored one, may I say there is no special formula or secret method of securing one? But judging from my own experience, you will receive the utmost co-operation from the state highway engineers.

The procedures involved in procuring and constructing a farm-to-market road are difficult, since there are three different units of government concerned. The state highway department is the "middleman" between the county and federal governments. On each mile of farm-to-market road you will find an average of six property owners. This group is equal to an additional unit of government, and the county highway department sponsoring a farm-to-market road is the "middleman" between this group and the state highway department. In many cases this group of property owners has not been given the proper consideration.

Don't proceed backwards in promoting one of these farm-to-market roads, by selecting the road, making all surveys and plans, and then attempting to get the right-of-way grants. A better plan is to make verbal arrangements with your state highway district engineer fixing the width of right-of-way, type of construction, changes in location, etc., which are all vital to the property owners. At this point, call a meeting of all the property owners adjoining the proposed road and present the plan to them for their approval.

The trend now is towards a dustless road, and in offering this type of road to a group of property owners it will be much easier to get their full co-operation than by simply telling them the road is going to be built regardless of their wishes. Inform them that if they do not avail themselves of the opportunity, some other section of your county will get this improved road. If the funds are not used in your county, they will be used in some other county in the state.

This procedure was followed in Wayne County in obtaining right-of-way for a farm-to-market road. On the day of the meeting, 17 out of 18 interested property owners agreed to grant the right-of-way for an 80-foot road, for the consideration of the construction of, or reconstruction of, the